

REMARKS

Claims 1-6, 9-11 and 13-30 are pending in this application. By this Amendment, claims 1, 3, 18 and 20 are amended. Claims 7, 8 and 12 are canceled without prejudice to, or disclaimer of, the subject matter recited in those claims. Claims 25-30 are added. The claim amendments and the new claims add no new matter as they are supported by at least Figs. 1 and 11, and paragraphs [0064], [0095] and [0096] of the specification. Reconsideration of the application based on the above amendments and the following remarks is respectfully requested.

The Office Action, in paragraph 4, objects to claims 8 and 9 as containing informalities. The cancellation of claim 8 renders the objection of that claim moot. With regard to claim 9, the amendments to claim 3 obviate the objection. Withdrawal of the objection to claim 9 is respectfully requested.

The Office Action, in paragraph 6, rejects claims 1-4, 7, 12-15, 18-22 and 24 under 35 U.S.C. §102(b) as being anticipated by Japanese Patent No. JP 09-197196 to Eguchi et al. (hereinafter "Eguchi"). The Office Action, in paragraph 15, rejects claims 5, 6, 9-11, 16 and 17 under 35 U.S.C. §103(a) as being unpatentable over Eguchi. The Office Action, in paragraph 20, rejects claim 8 under 35 U.S.C. §103(a) as being unpatentable over Eguchi as applied to claim 7 above, and further in view of U.S. Patent Application Pub. No. US 2003/0081899 to Hikichi et al. (hereinafter "Hikichi"). The cancellation of claim 8 renders the rejection of this claim moot. To the extent, however, that the subject matter recited in claim 8 is incorporated into independent claim 1, Applicant respectfully traverses this rejection. The Office Action, in paragraph 22, rejects claim 23 under 35 U.S.C. §103(a) as being unpatentable over Eguchi as applied to claim 18 above, and further in view of U.S. Patent No. 5,707,684 to Hayes et al. (hereinafter "Hayes"). These rejections are respectfully traversed.

Eguchi states that the problem to be solved is "to simply adjust an optical axis with high precision" (Abstract). With reference to Fig. 1 of Eguchi, the optical fiber and the optical

element are very carefully aligned in the connecting part, and the connecting part is applied therebetween and stretched in order to attempt to ensure that the precise alignment of all three components is maintained throughout the fabrication process. The Office Action, in paragraph 21, admits that Eguchi does not disclose a convex part of the end surface of the optical fiber. Rather, the Office Action cites Hikichi as disclosing a convex shape and asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fiber of Eguchi to comprise a convex part in order to minimize back reflection for optical optimal communication.

Hikichi teaches an optical fiber coupling system wherein the optical fiber is treated so that a core of the optical fiber is protruded from a clad, the protrusion shaped like a truncated cone or like a cone (Abstract). The objective of Hikichi is to suppress the back reflection light from an end surface of the optical fiber (paragraph [0001]). The invention disclosed in Hikichi addresses this objective by preferably modifying the forward end shape of the core at the end portion of the optical fiber to a truncated cone having a top area of not larger than $1/5$ as large as its bottom area. Optimally, the top area of the truncated cone may be substantially zero so that the forward end portion of the core can be regarded as being shaped like a cone (paragraph [0013]). Further, Hikichi discloses that the vertical angle of the conical core protrusion at the end portion of the optical fiber is selected to be in a range from 60° to 150° , both inclusively, and more preferably in a range from 60° to 100° , both inclusively (paragraph [0014]). Hikichi is, therefore, concerned only with the configuration of the end part of the optical fiber.

In fact, Hikichi discloses that the problem addressed is relatively independent of any refractive index matching of the resin comprising the connecting part. Specifically, even in the case where the refractive index of the optical fiber and the refractive index of the resin are matched with each other at room temperature, there is a possibility that reflection may increase to be higher than a tolerance limit in the vicinity of the upper or lower limit of the temperature

in use because of the refractive index difference caused by the change of the ambient temperature (paragraph [0010]). Based on the disclosure of Hikichi, it would have been understood to those of ordinary skill in the art that no particular interaction between an end surface of the optical fiber and a connecting part is disclosed.

The conclusion in the Office Action that Eguchi and Hikichi would have been combined in the manner disclosed "to comprise a convex part in order to minimize back reflections for optical communication," a combination which Applicant does not concede is suggested, would not have motivated one of ordinary skill in the art to modify the teachings of Eguchi with the teachings of Hikichi in order to produce the combinations of features recited in the pending claims.

Claim 1 recites, among other features, an optical element including an optical surface; an optical fiber, an end surface of the optical fiber having a convex part; and a connecting part that joins the convex part of the end surface of the optical fiber and the optical surface. These features are varyingly recited also in independent claims 3, 18 and 20. As the Office Action notes, Eguchi neither discloses, nor would it have suggested, a convex end part of the optical fiber. Hikichi neither discloses, nor would it have suggested, any specifically determined interaction between the disclosed optical fiber end part and the resin comprising the connecting part. Applicant respectfully submits that the combinations of all of the features recited in at least independent claims 1, 3, 18 and 20 are neither disclosed, nor would they have been suggested, by the combination of the applied references.

For at least the above reason, Applicant respectfully submits that independent claims 1, 3, 18 and 20 are neither anticipated, nor would they have rendered obvious, by Eguchi, Hikichi or a combination of these references. Additionally, claims 2, 4-6, 9-11, 13-17, 19 and 21-26 are also neither anticipated, nor would they have been suggested, by the combinations of the applied

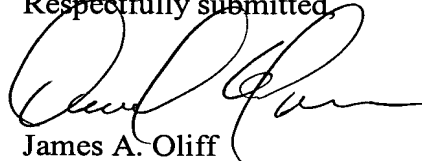
references for at least the respective dependence of these claims on independent claims 1, 3, 18 and 20, as well as for the separately patentable subject matter that each of these claims recites.

Accordingly, reconsideration and withdrawal of the rejections of claims 1-6, 9-11 and 13-24 under 35 U.S.C. §102(b) and 103(a) as being anticipated by, or unpatentable over, any combination of the applied references, is respectfully requested.

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-6, 9-11 and 13-26 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



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JAO:DAT/fpw

Attachment:
Amendment Transmittal

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